

INSTRUCTIONS



MODEL J400 RAPID SAW SET

IMPORTANT - READ CAREFULLY

BURR MANUFACTURING CO.
8931 VENICE BLVD.
LOS ANGELES, CALIF. 90034



BELL INDUSTRIES

SAW & MACHINE DIVISION

3390 W11th Ave. Eugene, Oregon 97402

(503) 342-5461

(Formerly Nielsen)

Serial #

77 B219

5568

— MOTOR NOTE —

The motor in your Bell Rapid Saw Set is mounted with the oil holes down. The oil cannot possibly run out. We suggest taking the machine loose from the bench once a year, turn it to an inverted position and add a few drops of oil in each oil hole. Use a good light weight oil similar to sewing machine oil.



ALTHOUGH THE NO. 13 DOES NOT APPEAR ON THE QUADRANT CASTING, YOU CAN SET 13 POINT SAWS, MERELY BY MOVING THE UPPER LEFT HAND CORNER OF THE SLIDE ABOUT $1/32$ " BEYOND THE NO. 12; THIS WILL AUTOMATICALLY POSITION THE BOTTOM RIGHT HAND CORNER OF THE SLIDE ABOUT $1/32$ " BEYOND THE NO. 14.

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OPERATION

With your Bell Rapid Saw Set unpacked and ready to set up, choose a spot on your bench for mounting which will give a clear space on either side of at least thirty-six inches. Fasten down all three legs securely. Plug in the power cord in a convenient outlet (110 volts AC 60 cycle). Place the foot switch on the floor conveniently to step on, and you are ready for operation.

The graduations on the quadrant corresponds to the number of teeth per inch on the saw. Set the red dot on the slide accordingly, depending upon the saw to be set. Or in the case of a 14 or 16 point saw match the lower right hand corner of the slide with the graduations on the lower side of the quadrant. Machines earlier than number 640 do not have these last two graduations, however they will set 14 and 16 point saws. This adjustment is best accomplished by loosening the knurled knob on the quadrant. With the right hand, squeeze the two feed levers together just enough to relieve the spring tension on the feeding mechanism, at the same time place one finger on the rod connecting to the knurled knob, (Fig. 1). Slide the red dot to the desired number, release feed levers, and then tighten knurled knob, finger tight only do not over-tighten.

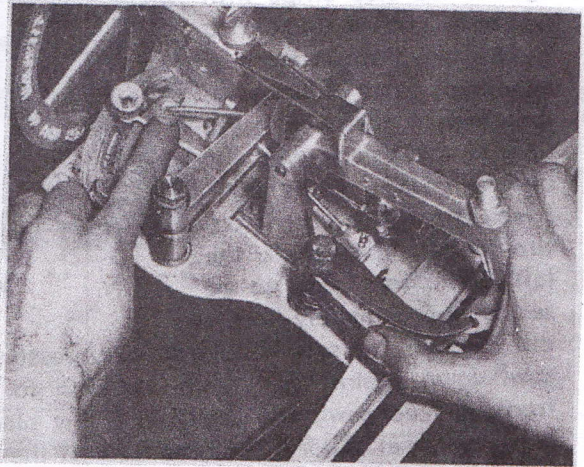


Figure 1.

We feel that it is very appropriate at this time to point out the fact that a saw in poor condition should be reconditioned so as to have uniform teeth and **not** be low in the middle. Also be sure that the end tooth at either end of the saw is not longer than the other teeth. Another important item is rust. Feeding a rusty saw through the machine would be like sliding emery cloth through, as rust is

very abrasive, it should be removed or at least oil the saw before setting. Furthermore, a rusty saw is very likely to break teeth when set by any method.

Arrows on pulley indicate direction of rotation. Rotate machine by hand sufficiently to bring hammer up. Hammer and lift rod on pressure pad will serve as a one hand grip to lift pressure pad from anvil sufficiently to allow saw to be inserted between anvil and pressure pad. (Fig. 2). As-

suming the saw is to be fed to the right first, with the saw in the right hand, insert under pressure pad as illustrated. If the handle stops the teeth from reaching the hardened strips, depress right hand table which will allow saw to fully enter. Holding the saw firmly against the stop strips with one hand, turn knurled knob (under saw blade in front of machine), so as to allow approximately half the tooth or less to project over the beveled portion of the anvil, never attempt to set the entire tooth. Slide saw to the left until first tooth to be set is approximately under

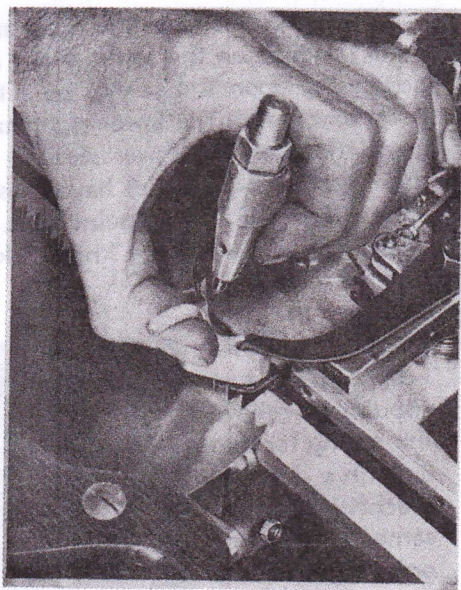


Figure 2.

the hammer, or saw handle strikes pressure pad. Flip left feed pawl down against saw teeth. If tooth to be set is directly in front of feed pawl, the saw is properly placed to be set. If the tooth to be set is not directly in front of the feed pawl, rotate pulley by hand back and forth until feed pawl is pushing on first tooth to be set.

Machine is now ready to run. Using both hands on saw, hold enough pressure to keep teeth firmly against stop strips. Do not press saw down or lift up off the anvil but allow pressure pad to hold saw flat with anvil while being set. Step on the switch, do not attempt to help the machine feed the saw but allow it to glide along as you shift your hands in short steps so as to keep a pressure towards center of the machine and in front of the hammer. As the

point of the saw leaves the left hand guide strip hold pressure slightly to the right of the pressure pad, thus completing one side. Do not allow the machine to continue running after the last tooth has been set, as continued hammering directly against anvil will shorten the life of hammer and anvil. With a little practice the machine can be stopped practically on the last tooth. Pull the end of the saw from under pressure pad with a slight jerk in the same direction it was feeding. Flip the feed pawl back, turn the saw over so as to feed in the opposite direction and repeat the operation, putting the other feed pawl down after the saw is inserted. Make certain that both feed pawls are never engaged at the same time. In a short time you will find that you can set the average saw in from fifty to sixty seconds without hurrying at all.

The thumb screw and lock on top of the machine in front of the pulley adjusts the hammer spring pressure. This can be adjusted for more or less hammer pressure as required, and seldom needs readjusting. (Fig. 4)

BAND SAWS

With the attachment, the machine will also set band saws from 1/4 inch to one inch in width in the same tooth sizes as

hand saws. The illustration (Fig. 3) shows very clearly the attachment and the method of holding to the pressure pad. Some provision will have to be made to carry the band saw either overhead or allow it to hang in front to suit the individual. If the latter method is preferred the machine will either

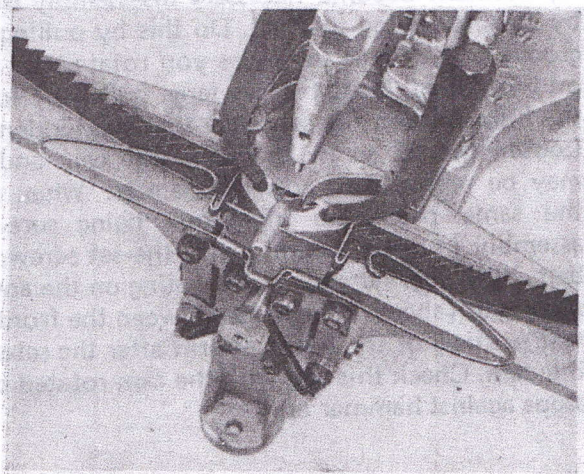


Figure 3.

have to be mounted on a stand by itself, or on a separate board and allowed to project over the front of the bench.

It is not necessary to loosen any screw or remove any part from the machine to install the band saw attachment, as the pressure pad springs are flexible enough to slide the attachment underneath. However the pressure pad can be removed if desired by lifting the end of the pressure pad springs one at a time out of the holes in the pressure pad and at the same time sliding the free end of the pressure pad forward. It may be of some advantage when setting band saws to lower the saw support tables by unhooking the springs at the lower ends. This is the two springs just below the depth of set adjustment.

ADJUSTMENTS

CAM SHAFT ASSEMBLY AND FEEDING MECHANISM

The cam shaft bearing assembly, which carries the large pulley and cam is properly adjusted before leaving the factory. The bearings are lubricated and sealed for life, therefore, there is no provision for oiling them. This assembly should give you no trouble for the life of the machine, but should any adjustment or replacement become necessary disassembly may be accomplished by first removing the belt. Do this by pulling the belt out of the groove of the large pulley as you rotate it as indicated by arrows on the pulley. Next remove large pulley by loosening set screw in the hub. Loosen the set screw that was hidden by the large pulley. Loosen the set screw that is in the cam and the shaft assembly may be pressed out toward the rear. When reassembling follow the same procedure in reverse being sure to lock the shaft assembly in place securely with the set screw. Replace pulley and belt. With the hammer point resting on the anvil there should be a small gap (about 1/64 inch) between the front of the cam and the rear portion of the hammer arm after the set-screw is tightened in the cam. Check this gap with the cam rotated backwards until cam stops against hammer arm.

Next comes the most critical adjustment of the entire machine and if not done properly the adjustments following cannot be made. Release feed lever springs by flipping out the ends that engage feed levers. This is the bent end that feed pawl rests against when disengaged from anvil. Rotate large pulley by hand until roller is

at point of greatest lift. (Back of cam). Rock pulley back and forth until this precise point on cam is located. Hold roller against cam by pressing outward lightly on one feed lever, at the same time loosen knurled knob over quadrant and move slide throughout its entire range. If the feed levers move at the same time the slide is being moved, this will indicate the push rod connecting from beneath the roller to the end of the quadrant needs adjusting. As the slide is moved toward the $4\frac{1}{2}$ end of the quadrant, notice which way the feed levers move. If they move so as to bring feed pawls together, the push rod is too long, and can be shortened by adjusting nuts which hold cam follower lever.

It may help to clarify the foregoing paragraph by pointing out the fact that all teeth, large or small, are fed up to the same position under the hammer. The feed pawls back up farther for large teeth than for small teeth. So when adjusting these parts, if the machine feeds large teeth farther than the small teeth, the push rod is too long. If the machine feeds small teeth farther than large teeth, the push rod is too short. After any adjustment of the push rod is made, each feed lever pull rod will very likely have to be re-adjusted also.

When this push rod is adjusted so as to make no movement of the feed levers as the slide is moved throughout its range and the roller on the high point of the cam, all that is necessary is to be sure all bolts are tight, lock nut on push rod snug against rod end. Engage feed lever springs again and adjust the pull rods which fasten to the short end of the feed levers so as to bring the tooth to be set squarely under the hammer point.

In normal use the machine will never get out of adjustment so as to overfeed, as any wear would tend to underfeed, and usually any feed adjustments to compensate for wear would be to merely shorten the two pull rods.

We find it much easier when making adjustments of the pull rods to remove the hammer spring assembly, which is held by two bolts fastening spring assembly to shaft housing. This will allow you to swing the hammer way back and get at the clevis pins in the short end of the feed levers more readily. Put a saw in position

to be set, preferably a fine tooth saw, adjust set so about half of tooth is over bevel of anvil set the slide in the quadrant accordingly, put proper feed pawl down to engage teeth. Rotate large pulley by hand until tooth is fully fed and feed pawl returns far enough to allow hammer to rest on saw tooth. If the tooth is not fed far enough, pull rod must be shortened. This is done by adjusting lock nuts on pull rod. A few trial adjustments may be necessary to bring tooth squarely under hammer point. If the tooth is being fed too far the rod must of course be lengthened instead of shortened.

SAW SUPPORT TABLES

The saw support tables each side of the anvil are adjusted before leaving the factory so as to be slightly lower than the upper surface of the anvil, to allow saw to clear. Should any adjustment become necessary the tables can be raised or lowered with the adjusting screws and lock nuts near the lower end of each. (Fig. 4) To lower the table, loosen lock nut and turn screw to the right while holding the table partially depressed. Check to see that table is lower than anvil and tighten lock nut.

BELT

The "V" belt is a standard Gates 2J73 belt and an adjustment for wear is provided. Should the belt need tightening, loosen the 10-32 nut on top of base (Fig. 4) allowing weight of motor to hang in belt. Turn nut underneath until it just touches the base, retighten nut on top. Do not over-tighten belt as very little tension is required.

OILING

Oil all moving parts and oil holes with a good grade of light oil, including wick oiler which cleans and oils face of cam (Fig. 4).

HAMMER AND ANVIL

When badly worn, the hammer face can be reground so as to do many more saws. This should be carefully done on the flat side of a grinding wheel using care to maintain the proper angle. If the hammer strikes too far over the edge of anvil after grinding, this can be corrected by removing the hammer head from the hammer arm and putting a thin washer between hammer head and hammer arm.

The upper surfaces of the anvil can also be ground in a similar fashion when necessary. The life of these two parts can be extended over many thousands of saws if the foregoing is correctly done. The proper bevel angle on these two parts is 15 degrees.

You have in your possession a machine engineered to do an exacting job, and with proper care should give years of satisfactory service with a minimum of parts replacements. The most likely adjustment the user will have to make is to shorten the two feed lever pull rods when necessary to feed saw teeth farther due to normal wear. (Small paragraph center of page 5).

The castings in this machine are of high quality aluminum alloy, except the cam. The cam is cast from Meehanite, a metal noted for its strength and long wearing ability. It is used extensively for cam shafts and cylinder blocks in the better grade automobiles. As long as it gets lubrication it will continue to get harder in use and will develop a glass like glaze at the rubbing surface.

— SUGGESTIONS, REPLACEMENTS, ETC. —

The only parts of the entire machine that will not interchange right and left are the two flat pressure pad springs, and the two feed lever coil springs. The saw support tables, feed-lever pull rods, feed levers, and feed pawls will fit either side. Furthermore the feed pawls were designed for double life as they can be reversed right and left when the corner eventually wears from pushing on the saw teeth. This will put the worn portion under the anvil and the unused part of the feed pawl on top to engage saw teeth.

The tempered steel insert in the rear portion of the hammer arm which contacts the front of cam may also be reversed so as to use either end.

When replacing the hammer point for any reason, be sure the set screw comes squarely against the flat place provided for it on the front of hammer point, then align hammer point fore and aft by loosening the $\frac{3}{8}$ nut and rotating the entire hammer in hammer arm. This will bring the set screw toward the front of machine. (Some early models have set screw on one side).

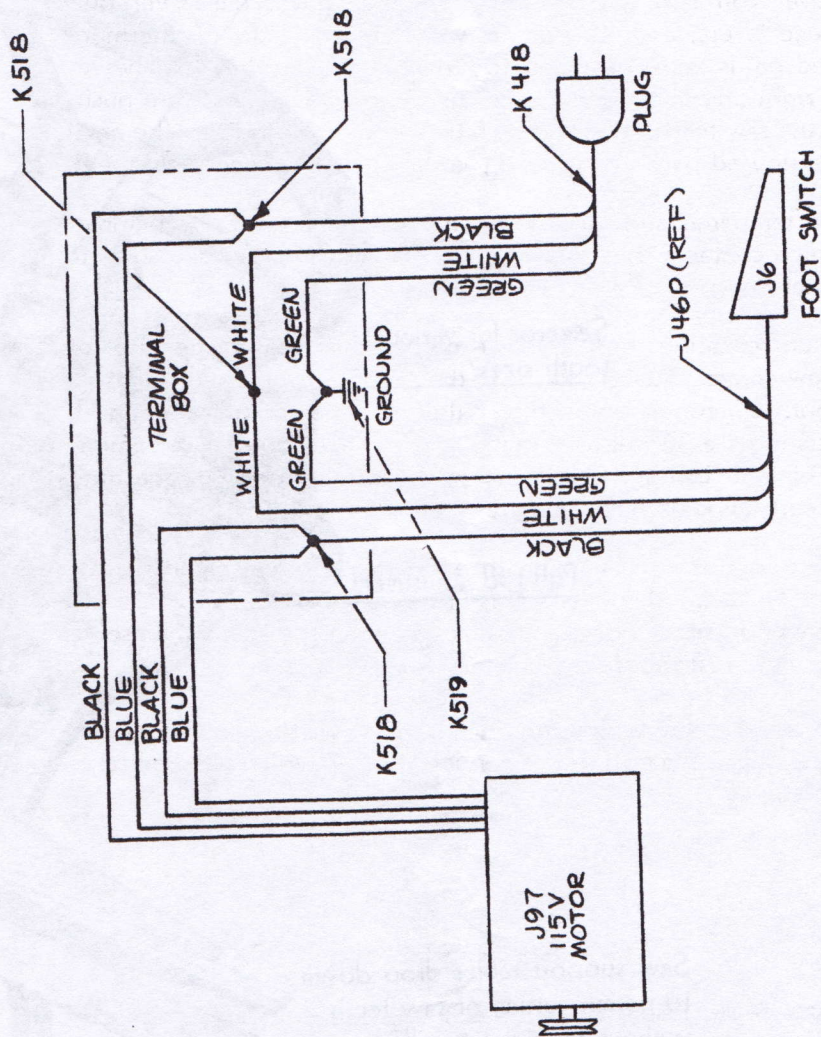
The hardened strips which the saw teeth guide against, leave the factory cadmium plated. This plating will wear off where the teeth pass but this is no indication of wear on the strips themselves which should last indefinitely.

To avoid delay when ordering parts or writing regarding your machine, **always** mention the serial number which is stamped on nameplate.

GUARANTEE

The J400 Rapid Saw Set is built to the highest modern standards and carries the following guarantee.

Should any part prove defective within one year after purchase that part will be replaced free of charge.



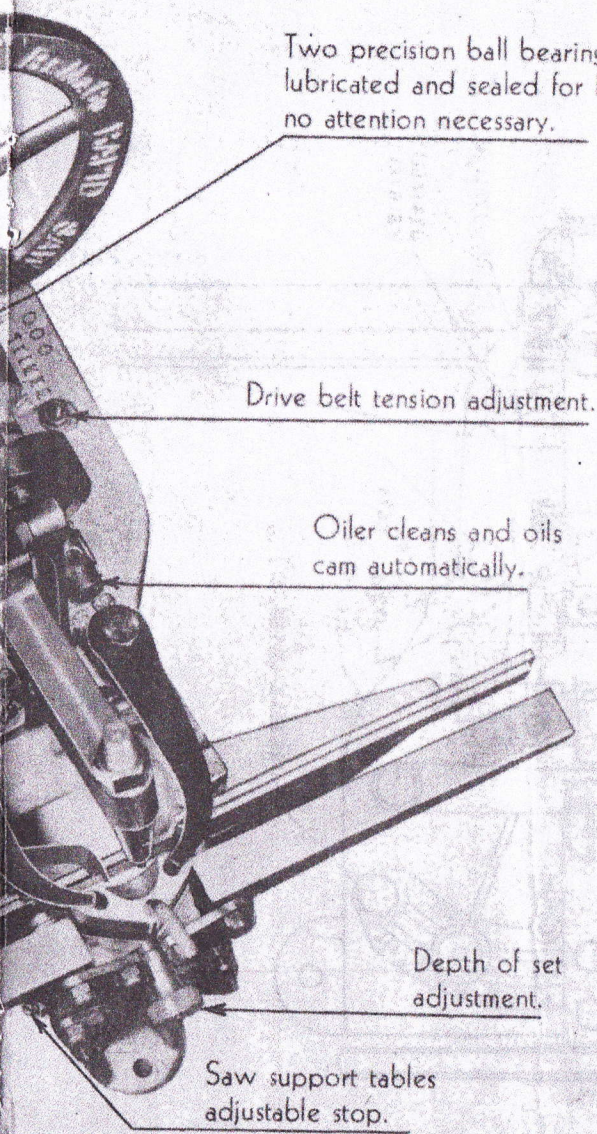
ELECTRICAL SCHEMATIC

Adjusting screw and lock nut
for hammer striking pressure.

Selector for various
tooth sizes.

Pull rod adjustment.

Saw support tables drop down
to permit setting of saw teeth
without removing handle.



Two precision ball bearings,
lubricated and sealed for life,
no attention necessary.

Drive belt tension adjustment.

Oiler cleans and oils
cam automatically.

Depth of set
adjustment.

Saw support tables
adjustable stop.

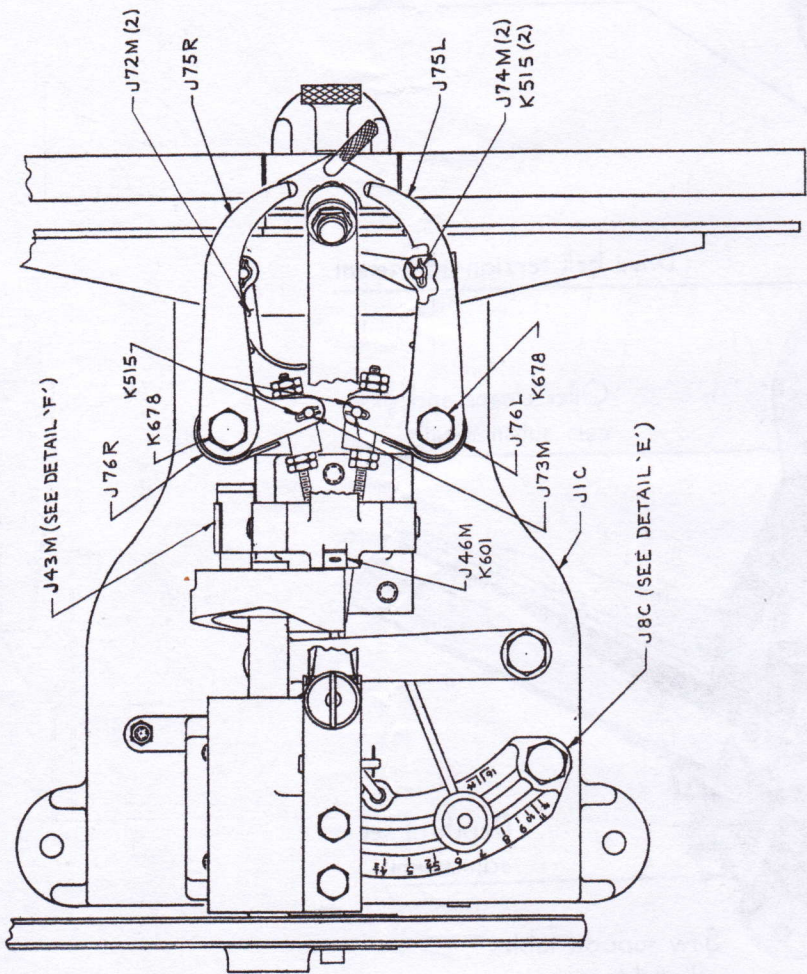


Figure 5-A

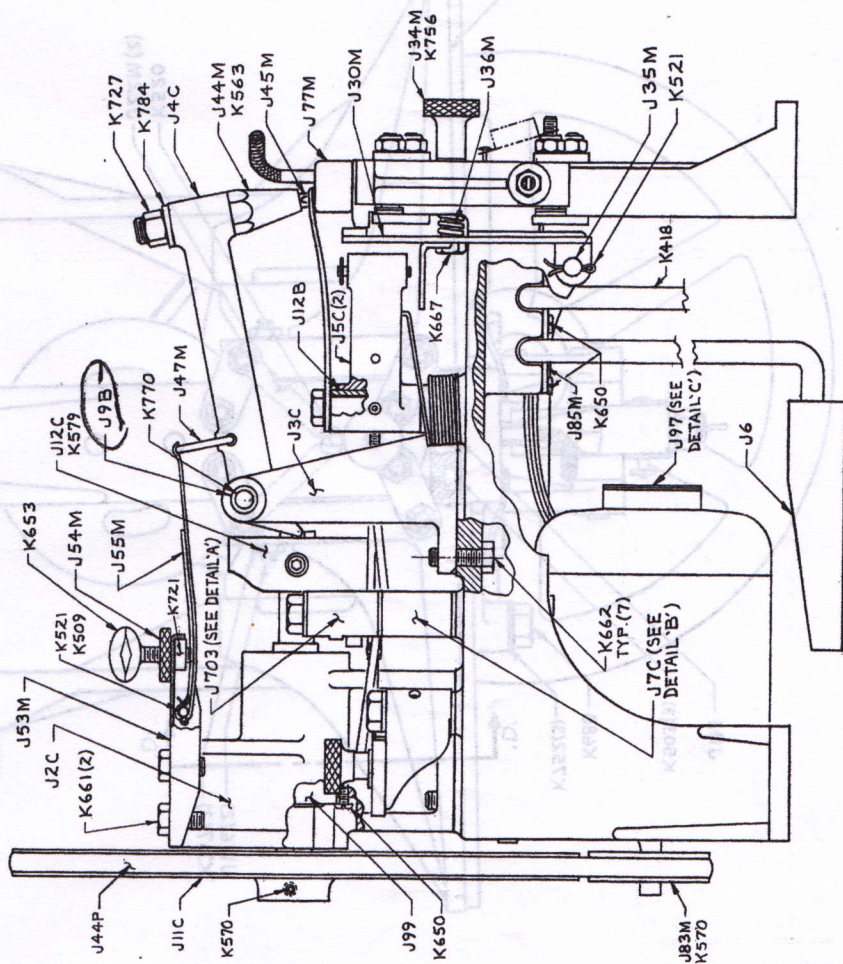


Figure 5-B

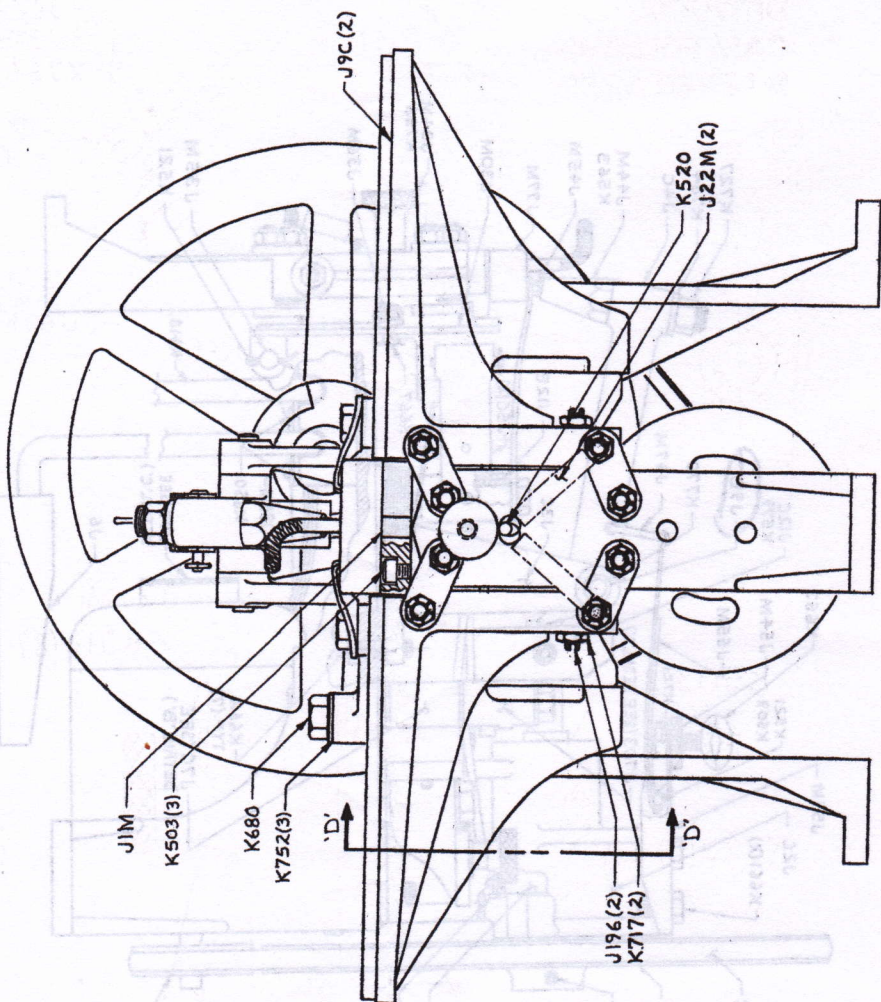
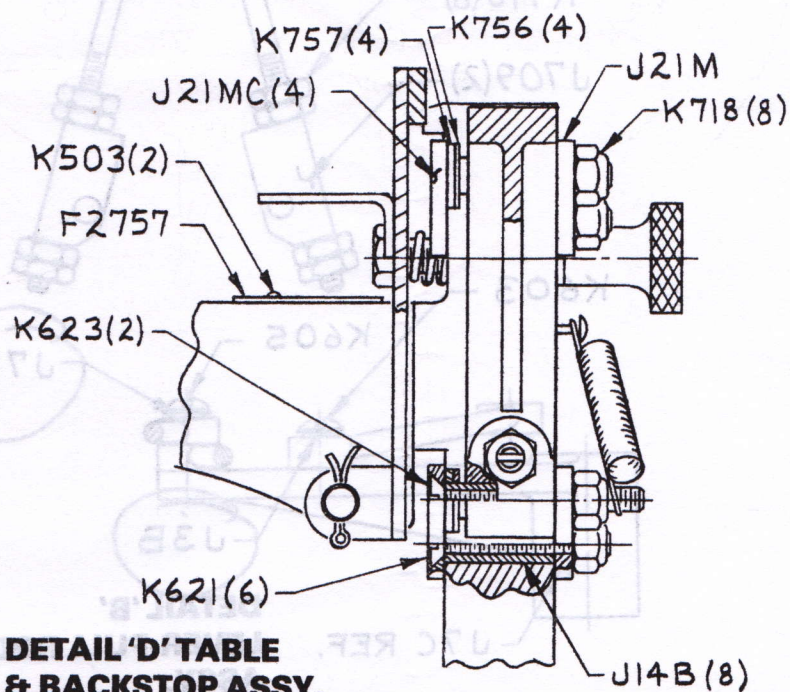
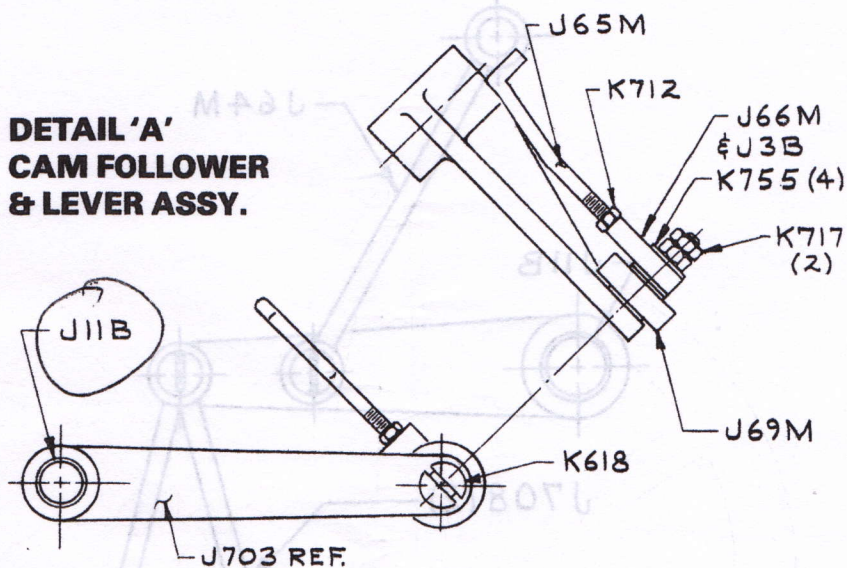


Figure 5-C

**DETAIL 'A'
CAM FOLLOWER
& LEVER ASSY.**



**DETAIL 'D' TABLE
& BACKSTOP ASSY.**

Figure 5-D

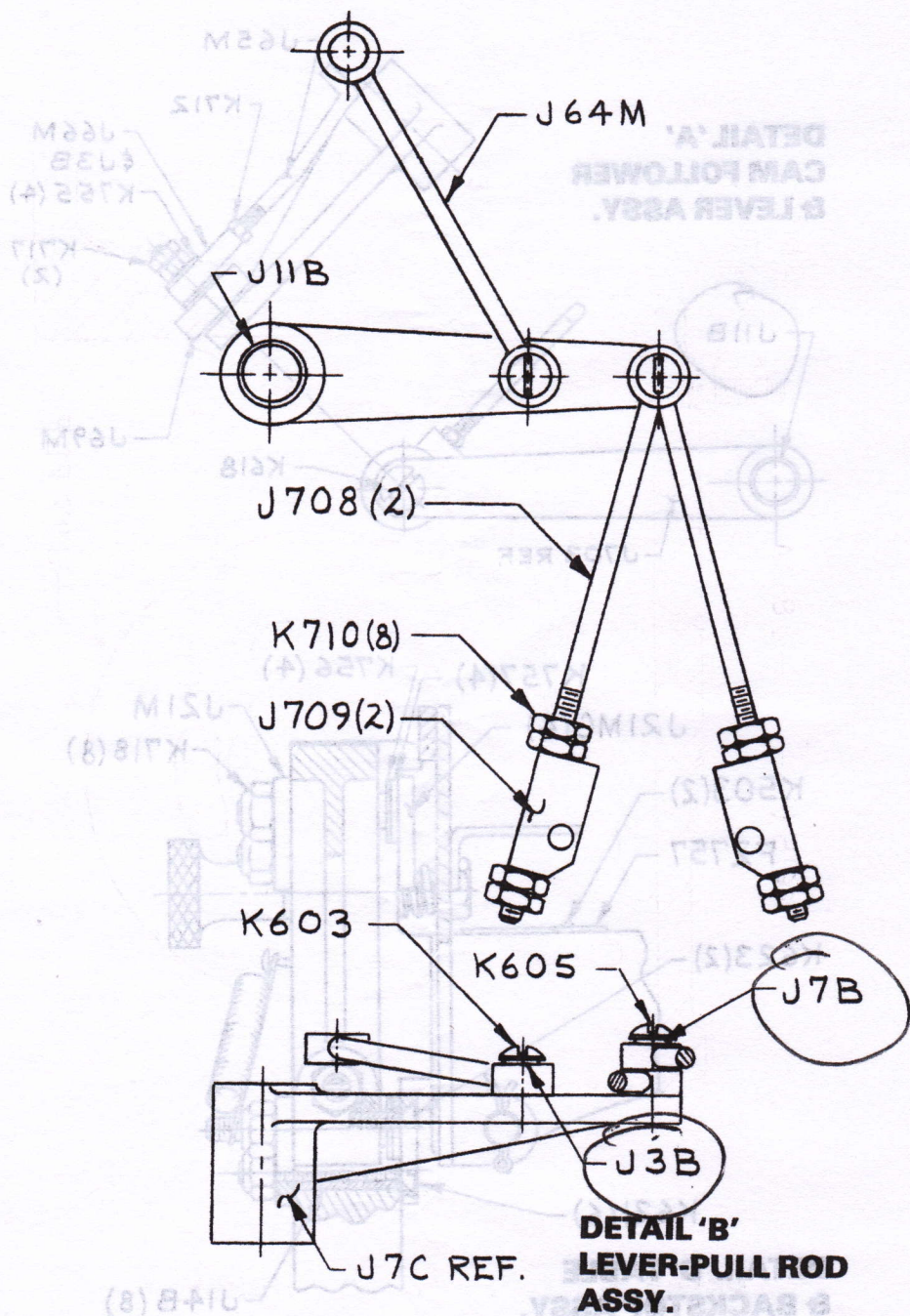
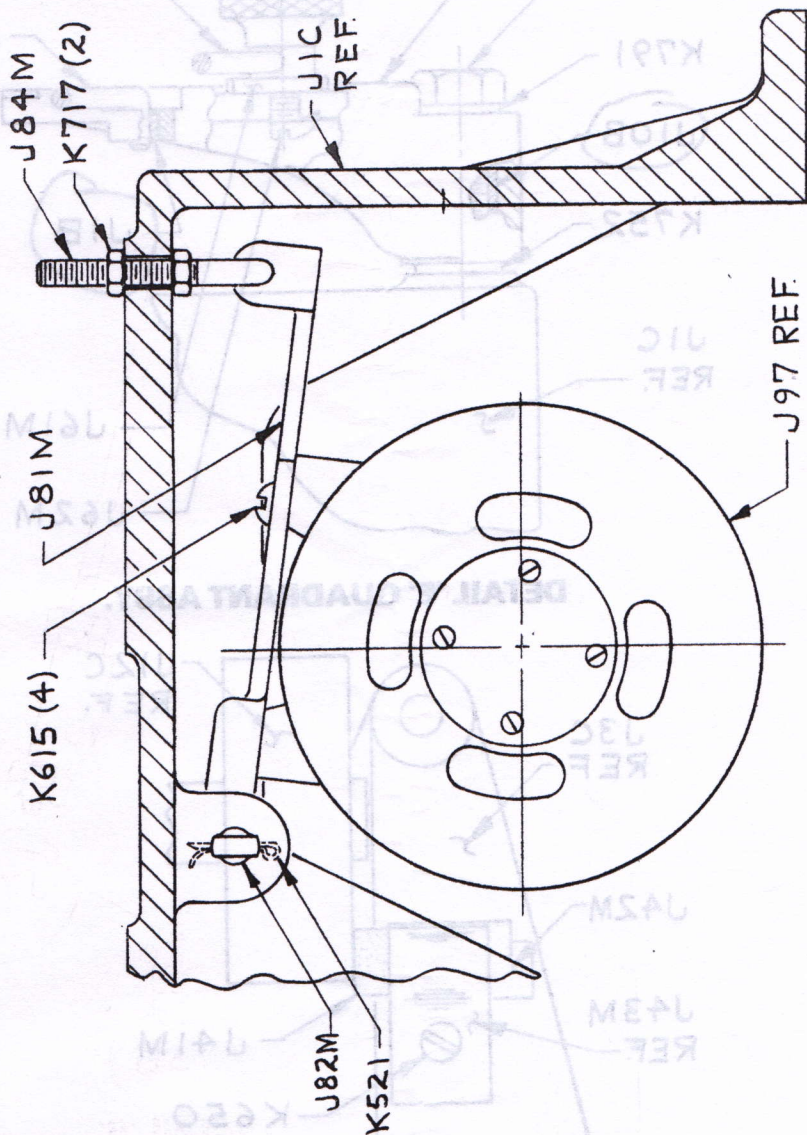
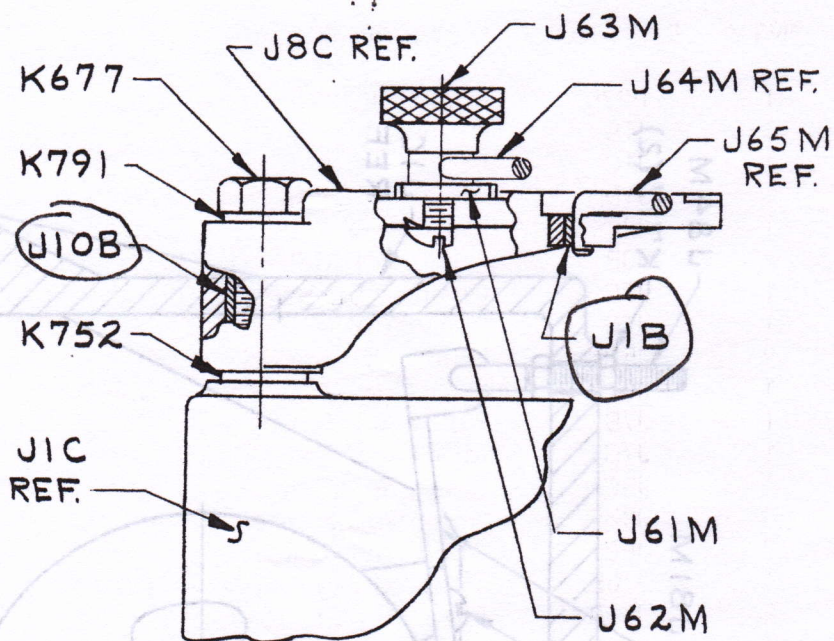


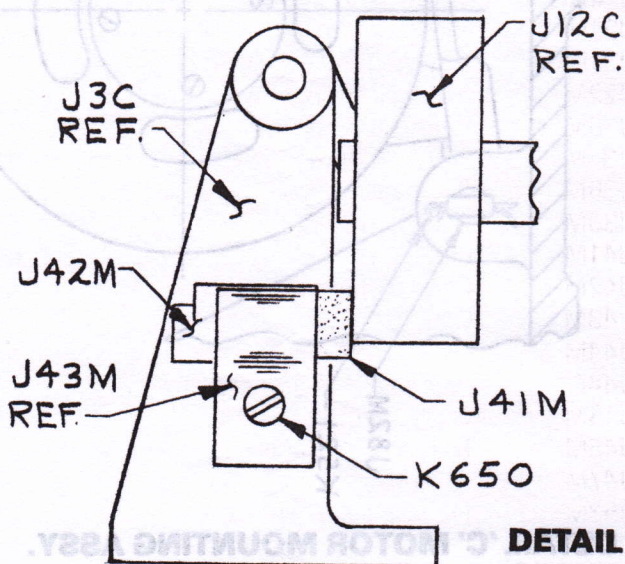
Figure 5-E



DETAIL 'C' MOTOR MOUNTING ASSY.



DETAIL 'E' QUADRANT ASSY.



**DETAIL 'F'
CAM OILER
ASSY.**

Figure 5-G

QNTY.	PART NO.	DESCRIPTION
1	F2757	Nameplate
1	J1B	Quadrant
1	J1C	Base
1	J1M	Anvil
1	J2C	Housing
2	J3B	Quadrant Rod Bushing
1	J3C	Hammer Arm Support
1	J4C	Hammer Arm
2	J5C	Feed Lever Assembly
1	J6	Foot Switch and Cord
1	J7B	Pull Rod Bushing
1	J7C	Idler Lever
1	J8C	Quadrant
2	J9B	Hammer Arm Bushing
2	J9C	Saw Support Table
1	J10B	Quadrant Bushing
2	J11B	Lever Bushing
1	J11C	Pulley
2	J12B	Feed Lever Bushing
1	J12C	Cam
8	J14B	Table Bushing
4	J21M	Link (Plain)
4	J21MC	Link (Countersunk)
2	J22M	Extension Spring
1	J30M	Back Stop Assembly
1	J34M	Knurled Nut
1	J35M	Back Stop Assembly Rod
1	J36M	Back Stop Spring
1	J41M	Oiler Felt
1	J42M	Oiler Tube
1	J43M	Oiler Clip
1	J44M	Hammer Head
1	J44P	Drive Belt (Gates No. 0270)
1	J45M	Striker Point
1	J46M	Hammer Arm Insert
1	J47M	Ring
1	J53M	Hammer Spring Bracket
1	J54M	Hammer Spring Lock Nut
1	J55M	Spring
1	J61M	Feed Selector Slide Assembly
1	J62M	Feed Selector Screw
1	J63M	Feed Selector Knob
1	J64M	Feed Selector Rod

QNTY.	PART NO.	DESCRIPTION
1	J65M	Push Rod
1	J66M	Rod End
1	J69M	Roller Bearing
2	J72M	Feed Pawl
2	J73M	Clevis Pin
2	J74M	Clevis Pin (long)
1	J75L	Press. Pad Spring, left
1	J75R	Press. Pad Spring, right
1	J76L	Feed Return Spring, left
1	J76R	Feed Return Spring, right
1	J77M	Pressure Pad Assembly
1	J81M	Motor Base
1	J82M	Motor Mounting Rod
1	J83M	Motor Pulley
1	J84M	'L' Bolt
1	J85M	Terminal Box Cover
1	J97	Electric Motor 120 volt 60/1
1	J99	Bearing
2	J196	Table Adjustment Screw
1	J703	Cam Follower Lever
2	J708	Pull Rod
2	J709	Rod End
1	K418	Electrical Cord and Plug
2	K503	Drive Screw, #2x1/4
1	K509	Clevis Pin, 1/8 Dia. x 13/16
4	K515	Cotter Clip, 3/32 Dia.
3	K518	Wire Nut
1	K519	Solderless Terminal
1	K520	Rnd. Hd. Brass Nail, #14x1/2
3	K521	Cotter Pin, 1/16 Dia. x 3/8
3	K530	Soc. Set Screw, #10-32x1/2
1	K563	Soc. Set Screw, #8-32x1/2
2	K570	Soc. Set Screw, #10-32x3/8
1	K579	Soc. Set Screw, #5/16-18x3/8
1	K601	Flt. Hd. Mach. Screw, #4-40x1/2
1	K603	Rnd. Hd. Mach. Screw, #8-32x3/8
1	K605	Rnd. Hd. Mach. Screw, #8-32x1/2
1	K613	Flt. Hd. Mach. Screw, #10-32x1
4	K615	Rnd. Hd. Mach. Screw, #10-32x3/8
6	K621	Flt. Hd. Mach. Screw, #10-32x1-1/4
2	K623	Flt. Hd. Mach. Screw, #10-32x1-1/2
4	K650	Pan Hd. Screw, #6x3/8
1	K653	Thumb Screw, 1/4-20x3/4

QNTY.	PART NO.	DESCRIPTION
2	K661	Hx. Hd. Cap Screw, 1/4-20x1/2
7	K662	Hx. Hd. Cap Screw, 5/16-18x2-3/4
1	K667	Hx. Hd. Mach. Screw, 1/4-28x1-3/4
1	K677	Hx. Hd. Cap Screw, 5/16-18x1-1/2
2	K678	Hx. Hd. Cap Screw, 5/16-18x1-3/4
1	K680	Hx. Hd. Cap Screw, 5/16-18-2-3/4
8	K710	Hx. Nut, #4-48
1	K712	Hx. Nut, #5-44
6	K717	Hx. Nut, #10-32
8	K718	Hx. Elastic Stop Nut #10-32
1	K721	Sq. Nut, 1/4-20
1	K727	Hx. Nut, 3/8-24
4	K752	Plain Washer, 5/16x11/16x1/16
4	K755	Plain Washer, #8
5	K756	Plain Washer, 1/4x7/16x1/32
4	K757	Plain Washer, 1/4x7/16x1/16
1	K770	Dowel Pin, 1/4 Dia. x 2-1/4
1	K784	Plain Washer, 3/8x5/8x1/32
1	K791	Plain Washer, 5/16x9/16x1/16

BE SURE TO MENTION THE SERIAL NUMBER OF YOUR MACHINE
WHEN ORDERING PARTS.

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BE SURE TO MENTION THE SERIAL NUMBER OF YOUR MACHINE

PRINTED IN U.S.A.

QNTY.	PART NO.	DESCRIPTION
1	K781	Plain Washer, 5/16x3/16x1/16
1	K784	Plain Washer, 3/8x5/8x1/32
1	K770	Dowel Pin, 1/4 Dia. x 2-1/4
4	K757	Plain Washer, 1/4x1/16x1/16
5	K756	Plain Washer, 1/4x1/16x1/32
4	K755	Plain Washer, #8
4	K752	Plain Washer, 5/16x1/16x1/16
1	K727	Hx. Nut, 3/8-24
1	K721	Sp. Nut, 1/4-20
8	K718	Hx. Elastic Stop Nut #10-32
8	K717	Hx. Nut, #10-32
1	K712	Hx. Nut, #8-44
8	K710	Hx. Nut, #8-48
1	K680	Hx. Hd. Cap Screw, 5/16-18-2-3/4
2	K678	Hx. Hd. Cap Screw, 5/16-18x1-3/4
1	K677	Hx. Hd. Cap Screw, 5/16-18x1-1/2
1	K667	Hx. Hd. Mach. Screw, 1/4-28x1-3/4
1	K662	Hx. Hd. Cap Screw, 5/16-18x2-3/4
2	K661	Hx. Hd. Cap Screw, 1/4-20x1/2